CLAIMS

1. A vehicle alignment gauging system including dimension measuring means, output signal generation means adapted to generate an output signal corresponding to dimensions indicated by the measuring means, storage means to store reference data corresponding to standard reference dimensions for a selected vehicle, comparator means to compare the output signal with a selected reference dimension from the storage means and to generate an error signal indicative of the variation therebetween, and variation display means to provide a visual indication of the magnitude of the variation, thereby in use to provide a quantitative indication of structural misalignment.

2. A system according to claim 1, wherein the measuring means include an extendable measuring tape, and the output signal is indicative of an operative or extended length of the tape.

3. A system according to claim 2, wherein said measuring tape comprises a flexible steel blade calibrated with visual indicia and adapted to extend by unwinding from a spool contained within a housing.

4. A system according to claim 3, further including bias means tending resiliently to retract the tape by rewinding onto the spool.

5. A system according claim 4, wherein the output signal generation means include a position transducer adapted to generate the output signal in the form of an electric current or voltage indicative of the extended length of the measuring tape.

6. A system according to claim 5, wherein the position transducer is a rotary potentiometer associated with the tape spool.

7. A system according to any one of claim 6, wherein the position transducer is a linear potentiometer associated with the tape blade.

8. A system according to claim 7, further including output signal display means to display a visual indication of the extended length of the measuring tape according to the output signal, thereby to permit visual correlation between the indicia on the measuring tape and the output signal.

9. A system according to any one of claims 2 to 8, including a pair of said measuring tapes, one tape being disposed for measurement in horizontal planes and the other tape being adapted for measurement in vertical planes.

10. A system according to claim 9, wherein said measuring tapes are supported in mutually orthogonal relationship within a common housing, forming part of an integrated measurement module.

11. A system according to claim 10, wherein the output signal display means associated with each said measuring tape are disposed on or adjacent said housing.

12. A system according to any one of the preceding claims, wherein said storage means form part of a computer.

13. A system according to claim 12, wherein said storage means include one or more of a CD ROM, a floppy disk, an internal hard disk, a magnetic tape drive, random access memory (RAM) or read only memory (ROM).

14. A system according to claim 13, wherein said reference data is initially provided in CD ROM form for downloading onto a disk drive associated with the computer.

15. A system according to any one of claims 12 to 14, wherein the comparator means take the form of software configured to perform a sequence of operations using the reference data and the output signal in order to generate the error signal.

16. A system according to claim 15, wherein the software is configured to enable an operator to select a reference dimension from a range of standard reference dimensions for the vehicle from the storage means.

17. A system according to any one of claims 10 to 16, wherein the variation display means are disposed on or adjacent the housing to provide direct feedback of the error signal to the operator while working on the vehicle.

18. A system according to any one of the preceding claims, further including recordal means adapted to record the error signal in relation to the corresponding reference dimension in response to a command input by an operator, thereby to provide a record of the extent of structural deviation from specification after repair work has been carried out.

19. A system according to claim 18, wherein the recordal means include printing means adapted to produce a hard copy of a report after repair operations have been carried out, to confirm that deviations from specification are within acceptable tolerances.

20. A system according to any one of claims 10 to 19, further including a remotely operable scrolling mechanism located on or adjacent the housing, to permit an operator to scroll through a range of selected reference dimensions and to view on the variation display means a corresponding sequence of calculated variation measurements derived from the error signals while working on the vehicle.

21. A system according to any one of the preceding claims, further including a datum bar, a pair of first carriage assemblies slidably mounted to the datum bar, attachment means adapted releasably to secure each of said first carriage assemblies to a respective datum point on the vehicle and thereby to suspend the datum bar in a transverse orientation beneath the vehicle, and a trammel bar connected at one end to said datum bar by connection means, the connection means being adjustable to selected positions along the datum bar and permitting a degree of universal movement of the trammel bar relative to the datum bar.

22. A system according to claim 21, wherein the measuring means are adapted for mounting on the trammel bar to provide measurement readings relative to the datum bar.

23. A system according to claim 22, wherein the connection means include a trammel carriage adapted to traverse the datum bar and a universal joint mounted to the trammel carriage, to permit independent relative rotation about non-parallel axes.

24. A system according to any one of claims 10 to 23, wherein said housing further includes a slidable reference pointer adapted for connection with the vertically oriented measuring tape for engagement with selected datum points on the vehicle such that with the trammel bar in a generally horizontal orientation, the vertical tape provides a measure indicative of the vertical distance between the datum bar and the reference pointer and the horizontal tape provides a measure of the horizontal distance between the datum bar and the reference pointer.

25. A system according to claim 24, further including adjustable levelling means to indicate when the trammel bar is oriented horizontally relative to the vehicle.

26. A system according to claim 25, wherein the levelling means take the form of a detachable spirit level.